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Gingival Abscess Removal Using a Soft-Tissue Laser

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LEARNING OBJECTIVES:

After reading this article, the individual will learn:

- The etiology, clinical presentation, and diagnosis of gingival abscess.
- One treatment modality for gingival abscess using a soft-tissue laser.

ABOUT THE AUTHORS



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Disclosure: Dr. Andreana is the laser consultant and trainer for Ivoclar Vivadent.

INTRODUCTION

Gingival abscess, also known as parulis, is defined as a localized, acute inflammatory lesion that may arise from a number of sources, including microbial plaque infection, trauma, and foreign body impaction.¹⁻⁴ It often presents as a smooth, fluctuant, red-color swelling and can occasionally be painful. It is generally limited to marginal and interdental gingiva.⁵ Based on its location it has been classified as a type of periodontal abscess which does not involve any attachment loss.⁶ The treatment comprises of removal of the cause and, in acute situations, excision of the abscess.^{2,3} A typical gingival abscess is easy to diagnose; however, as suggested by the lack of literature, it is rarely seen in clinical situations.

This article presents a clinical case of a gingival abscess located adjacent to recently-placed implants, and discusses its etiology, histopathology, and treatment with an 810-nm soft-tissue diode laser.

CLINICAL REPORT

A 72-year-old white male presented to the clinic to restore his mandibular left posterior area with implants (Figure 1). After diagnosis, it was decided to place implants in the edentulous area of the first and second left mandibular molars followed by restoration with abutments and single crowns. Diagnostic tooth setup was performed to plan replacement of the missing teeth. A surgical template was fabricated and tried in intraorally to verify the position and orientation of the implants. Medical history was carefully reviewed, and contraindications to surgical treatment were ruled out. After preliminary diagnostic data collection, a surgical visit was scheduled. Following assessment of vital signs, local anesthesia was administered and full thickness



Figure 1.
Edentulous area
associated with sites
Nos. 18 and 19.

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flaps were elevated. Two Nobel Biocare implants (NobelReplace tapered 5 x 13 mm [Nobel Biocare]) with healing abutments (NobelReplace healing abutment 6 x 3 mm [Nobel Biocare]) were placed with the help of a surgical template to replace the missing first and second mandibular left molars (Figure 2). The flaps were sutured (Figure 3) with polyglactin sutures (4-0 Vicryl [Ethicon, Johnson & Johnson]) and the patient was given post-treatment instructions. A prescription for amoxicillin 250 mg 4 times a day for 7 days was given. Additionally, chlorhexidine gluconate 0.12% rinse was prescribed to be started the day following the surgery. The patient was called the day after surgery to assess initial postsurgical status and was recalled after 2 weeks for suture removal.

At the time of suture removal, a round mass was observed on the buccal aspect of the implant near the left mandibular first molar region (Figure 4). It presented as a yellowish, smooth, fluctuant mass measuring 0.5 x 0.5 x 0.5 cm. The patient did not complain of pain or discomfort associated with the mass. An intraoral periapical radiograph was made (Figure 5) to exclude hard-tissue involvement. Clinical presentation was typical of a gingival abscess. To confirm the diagnosis, the mass was excised completely with the aid of a soft-tissue laser (Odyssey 2.4G Diode Laser [Ivoclar Vivadent]) set at 1.0 watt power in continuous mode (Figure 6). The lesion was enucleated without the use of anesthesia and submitted for histopathologic assessment. Sutures were not placed in the excised area (Figure 7). The patient was instructed not to consume any acidic or hot food for 3 days and was called after 24 hours for a postbiopsy evaluation. Additional recalls were scheduled at one-week and 3-week intervals.

The laboratory report confirmed the diagnosis. The specimen consisted of dense fibrous connective tissue with focal areas of granulation tissue along with numerous interspersed hyperemic blood capillaries, neutrophils, and micro-abscess formation. Areas of collagen necrosis were also present. Lymphocyte infiltration was seen throughout the specimen. The granulation tissue with micro-abscess formation and sub-acute inflammation was consistent with the diagnosis of gingival abscess (Figures 8 and 9).

At the one-week postexcision evaluation, the site was

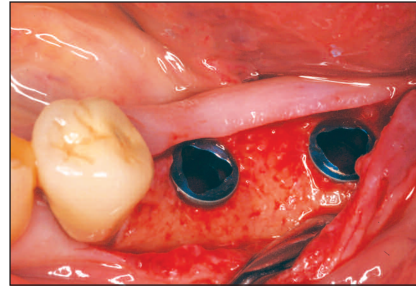


Figure 2. Surgical phase showing implant placement replacing teeth Nos. 18 and 19.

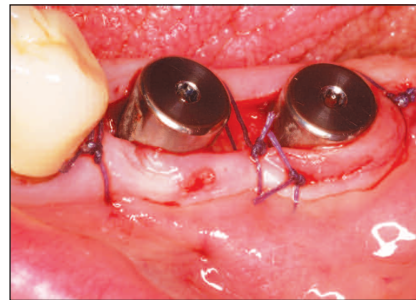


Figure 3. One-stage implant placement with healing abutments and non-resorbable sutures in place.



Figure 4. Suture removal after 3 weeks. Note the presence of a round mass buccal to implant No. 19.

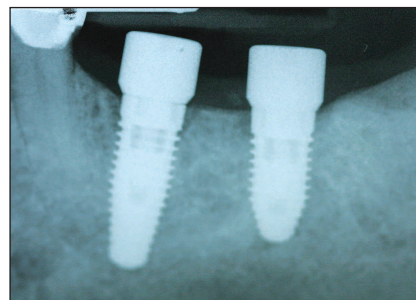


Figure 5. Radiograph showing absence of hard-tissue involvement.



Figure 6. Excision of exposed gingival mass with soft-tissue laser.

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found to be healing well (Figure 10). Discomfort or any other adverse events were not reported by the patient. Clinical resolution was observed within 3 weeks postexcision (Figure 11).

DISCUSSION

Gingival abscess is considered an acute inflammatory enlargement of gingiva without attachment loss.³ It is generally localized, occasionally painful, rapidly expanding, and usually is of sudden onset. A slow-developing gingival abscess may go unnoticed and present no symptoms until it has become severe. In its early stages it appears as a reddish-colored mass with a smooth and shiny surface. However, within 48 hours it becomes pointed and fluctuant with a surface orifice from which a purulent exudate may express. The adjacent teeth may be symptomatic to percussion. If left alone, gingival abscess usually ruptures spontaneously.^{3,4}

From a histopathological aspect, gingival abscess consists of a purulent focus in the connective tissue surrounded by diffuse infiltration of polymorphonuclear leukocytes, edematous tissue, and vascular engorgement. The surface epithelium has varying degrees of intracellular and extracellular edema. At times, invasion by leukocytes along with ulceration may also be present.^{3,4}

The gingival abscess can be easily confused with a periodontal abscess.⁵ However, there are distinct differences between the two, specifically, in their location and history. The gingival abscess is confined to the marginal gingiva and is often seen in previously disease-free areas. It is usually an acute inflammatory response to foreign body trauma to the gingiva. On the other hand, the periodontal abscess involves the supporting periodontal structures and generally occurs during the course of chronic destructive periodontitis. A gingival abscess may occur in the presence or absence of a periodontal abscess.⁵

Treatment of gingival abscess consists of immediate removal of the cause and reversal of the acute phase. Therefore, the treatment includes removal of any impinging and/or irritating foreign body, and in acute situations, excising the abscess completely. When possible, scaling and root planing is also performed to establish drainage and removal of microbial deposits from teeth adjacent to the

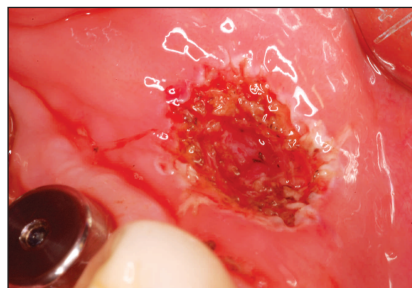


Figure 7.
Excised mass with complete hemostasis.

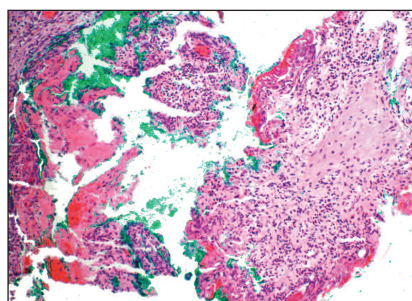


Figure 8.
Histopathologic appearance of gingival abscess at low magnification.

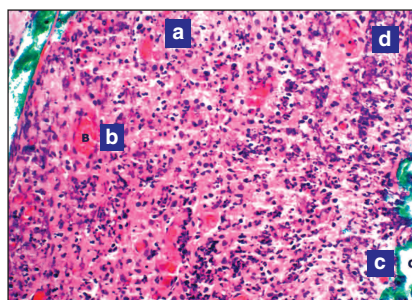


Figure 9.
Histological appearance of gingival abscess at high magnification. Note the diffuse infiltration of polymorphonuclear leukocytes (a), engorged and hyperemic capillaries (b), micro-abscess (c), and collagen fiber necrosis (d).



Figure 10.
One week postexcision showing healing progressing uneventfully.



Figure 11.
Three weeks postexcision showing completely healed site.

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abscess. Furthermore, oral hygiene instruction is important with regard to the proper techniques for flossing and brushing. With the removal of the etiology, resolution is usually observed within 2 to 3 weeks.³

According to Carranza and Hogan,⁷ gingival abscess is caused by forcefully embedding a foreign substance in the gingival tissue or by bacterial contamination of the soft-tissue via overly forceful tooth brushing. In this case, the patient was questioned if he recalled having any accidental foreign body injury at the time of eating or brushing that could have caused the lesion. The patient could not recollect having any such experience. Therefore, the etiology of abscess in this case still remains unknown.

Use of diode lasers for excision has proven to be an effective treatment approach in many situations,⁸⁻¹¹ and in this case such treatment resulted in uneventful resolution of the lesion. Particularly of interest was the lack of bleeding, the nonsuturing technique, and uneventful healing. The use of diode lasers for soft-tissue healing has been reported by Capon, et al;¹² Al-Watban, et al;¹³ and Güngörmüş and Akyol¹⁴ in animal models as well as in humans by Amorim, et al.¹⁵ Ciancio, et al¹⁶ studied the effect of the 810-nm diode laser in conjunction with scaling and root planing on periodontal wound healing and concluded that the diode laser improved the soft-tissue healing and increased patient comfort. In the case presented, the procedure was performed without the use of local anesthetic agent. The US Food and Drug Administration has approved the use of several diode laser devices, indicating its safety when used according to the manufacturer's instructions.^{16,17}

SUMMARY

A case of acute inflammatory enlargement of gingival tissue in the form of a gingival abscess is presented in this paper. Its clinical features and histopathologic presentation are described. The etiology of this condition could be a variety of sources such as microbial plaque infection, trauma, and foreign body impaction. In this case, treatment included complete excision by the means of a 810-nm soft-tissue diode laser, which resulted in resolution of the abscess and clinical wound healing within approximately 2 to 3 weeks. Prognosis was excellent due to early diagnosis and immediate treatment.

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POST EXAMINATION QUESTIONS

1. **Gingival abscess is also known as:**
 - a. Periapical abscess.
 - b. Parulis.
 - c. Epulis.
 - d. None of the above.
2. **Gingival abscess may arise from:**
 - a. Microbial plaque infection.
 - b. Trauma.
 - c. Foreign body impaction.
 - d. All of the above.
3. **Which of the following is TRUE regarding gingival abscess?**
 - a. Often presents as a smooth, fluctuant, red-color swelling.
 - b. Is occasionally painful.
 - c. Is generally limited to marginal and interdental gingiva.
 - d. All of the above.
4. **If left untreated a gingival abscess usually:**
 - a. Resolves and disappears without recurrence.
 - b. Resolves and recurs.
 - c. Ruptures spontaneously.
 - d. Spreads to other locations.
5. **Which of the following statements is TRUE?**
 - a. Gingival abscess always occurs in the presence of periodontal disease.
 - b. Gingival abscess is usually associated with attachment loss.
 - c. Gingival abscess is a chronic inflammatory condition.
 - d. Gingival abscess is rapidly expanding and usually of sudden onset.
6. **The gingival abscess can easily be confused with:**
 - a. Amalgam tattoo.
 - b. Aspirin burn.
 - c. Periodontal abscess.
 - d. None of the above.
7. **In the case presented, which of the following histopathologic findings apply?**
 - a. No areas of collagen necrosis were found.
 - b. Lymphocyte infiltration within the specimen was absent.
 - c. Neutrophils were absent.
 - d. Numerous interspersed hyperemic blood capillaries were found.
8. **In the case presented, clinical resolution of the gingival abscess was observed within:**
 - a. One week postexcision.
 - b. Two weeks postexcision.
 - c. Three weeks postexcision.
 - d. Four weeks postexcision.

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